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EXAMINER	
ECHELMEYER, ALIX ELIZABETH	
ART UNIT	**PAPER NUMBER**
1795	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/644,866	HISAMITSU ET AL.	
	Examiner	Art Unit	
	Alix Elizabeth Echelmeyer	1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *11 June 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-22* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-22* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. This Office Action is in response to the amendment filed June 11, 2008. Claims 1 and 20 have been amended. Claims 21 and 22 have been added. Claims 1-22 are pending and are rejected finally for the reasons given below.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1-7, 13-16 and 20-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Meitav et al. (US 6,576,365) in view of Fujita et al. (US 6,225,779), Okazaki et al. (JP 11-339828 A) and Benson et al. (US 2003/0027043).

Meitav et al. teach an electrochemical energy storage device having multi-cell stacks that may be connected in series or parallel (abstract, column 1 lines 29-31; column 6 lines 17-19).

The battery cells of Meitav et al. comprise bipolar current collectors, electrodes and an electrolyte between the electrodes (column 2 lines 50-54; column 8 lines 1-32, 51-52). The bipolar current collectors having electrodes on either side as taught by Meitav et al. are the same as the bipolar electrodes of the instant invention.

Meitav et al. further teach tabs for connection of the current collectors to other electrochemical devices or circuitry (column 7 lines 32-34). These tabs are considered to be main circuit tab electrodes, since it is taught in the instant invention that the main circuit tab electrodes are formed as part of the current collectors ([0099] of US 2004/0038123).

With regard to claim 6, Meitav et al. teach that the stacks may be connected in parallel (column 1 lines 29-31; column 6 lines 17-19).

Meitav et al. fail to teach measuring the voltage of the individual cells using a power supply monitoring circuit.

Fujita et al. teach a power supply monitoring integrated circuit for individually measuring the voltages of a plurality of lithium-ion cells connected in series (abstract).

Regarding claim 13, Fujita et al. teach a discharge control circuit (Fig. 2).

Fujita et al. further teach that the individual cell monitoring system offers more secure protection of the cells by detecting voltages with higher accuracy and by making correct judgments even when a disconnection occurs (column 3 lines 22-25).

It would be advantageous to use the individual cell monitoring system of Fujita et al. with the battery of Meitav et al., since the monitoring system of Fujita et al. offers secure protection of the cells by detecting voltages with higher accuracy and by making correct judgments even when a disconnection occurs.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use the individual cell monitoring system of Fujita et

al. with the battery of Meitav et al. since the monitoring system of Fujita et al. offers more secure protection of the cells.

Meitav et al. in view of Fujita et al. fail to teach tabs for measuring the voltages.

Okazaki et al. teach a fuel cell system that contains means for measuring each cell within the stack ([0003]). The voltages are measured by connecting leads to projections provided on the edges of separators within the fuel cell ([0008]). The projections may be "tabular" in shape, which the examiner interprets to mean that they may be tabs ([0031]).

Although Okazaki et al. teaches a fuel cell, and Applicants' invention, and Meitav et al. in view Fujita et al., are drawn to a battery, it has been held that a prior art reference must either be in the field of applicant's endeavor or, if not, then be reasonably pertinent to the particular problem with which the applicant was concerned, in order to be relied upon as a basis for rejection of the claimed invention. See *In re Oetiker*, 977 F.2d 1443, 24 USPQ2d 1443 (Fed. Cir. 1992). In this case, Okazaki et al. may be considered analogous art since Okazaki et al., the instant invention, and Meitav et al. in view Fujita et al. are concerned with power generation by cells that are formed in a stack. Further, all are pertinent to the particular problem of measuring voltage in individual cells in a stack.

Regarding the positions of the tabs disclosed in claims 1-5 and 16, Okazaki et al. fail to teach the deviated tabs on one or both sides of the stack. It would have been obvious to one having ordinary skill in the art at the time the invention was made to

place the tabs in a deviated manner on the edge of the stack, since it would allow easier access to the tabs by eliminating some of the crowding resulting from the tabs being in a line. It has been held that rearranging parts of an invention involves only routine skill in the art. MPEP 2144.04 (VIC).

As for claim 14, Okazaki et al. teach a socket connected to the tabs ([0009]). The socket measures an electrical potential difference.

Regarding claim 15, Meitav et al. in view Fujita et al. in view of Okazaki et al. fail to teach that the socket and control system are integrally formed. It would have been obvious to one having ordinary skill in the art at the time the invention was made to connect the socket to the controller, since the controller would need to obtain the measurements from the socket in order to obtain and process voltage information from the tabs. Further, by making the two parts integral, assembly of the system would be simplified. It has been held that forming in one piece an article, which has formerly been formed in two pieces, and put together, involves only routine skill in the art. MPEP 2144.04 (VB).

As for claim 20, Meitav et al. in view Fujita et al. and Okazaki et al. teach all of the claimed limitations as discussed above, including providing plurality of stacked unit cells connected in series and providing shared voltage measurement tab electrodes on the unit cells.

Okazaki et al. teach that having connections to tabs on each cell in a stack allows for detection of abnormalities in each cell more promptly ([0038]).

It would be desirable to provide tabs on each cell in the plurality of battery cells in Meitav et al. in view Fujita et al. as taught by Okazaki et al. in order to detect malfunctions in the cells.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide tabs on each cell in the plurality of battery cells in Meitav et al. in view Fujita et al. as taught by Okazaki et al. in order to detect malfunctions in the cells.

Meitav et al. in view of Fujita et al. and Okazaki et al. fail to teach that the main circuit tab electrodes (as found in Meitav et al.) extend from the stack perpendicularly to both the stack and to the shared voltage measurement tabs (of Okazaki et al.).

Benson et al. teach terminals (22, 24), or main circuit tab electrodes, extending on opposite sides of the stack (Figure 3). This orientation is desirable because, when the main circuit tab electrodes are formed on the same side, it is difficult to electronically connect a package of batteries in compact configuration ([0005]).

Benson et al. does not teach shared voltage measurement tabs on the sides perpendicular to the main circuit electrode tabs, but the above discussed teachings already render such tabs obvious. It would have been obvious to one having ordinary skill in the art at the time the invention was made to put the voltage measurement tabs (of Okazaki et al.) on the side perpendicular to the main circuit tab electrodes as taught by Benson et al. since one of ordinary skill in the art would clearly see that the shared voltage measurement tabs would get in the way of the main circuit tab electrodes, thus

negating the positive effects of putting the main circuit tab electrodes on opposite ends to form a compact configuration. It has been held that rearranging parts of an invention involves only routine skill in the art. (See MPEM 2144.04(VI C))

As for claims 21 and 22, it is clear from Figure 3 of Benson et al. that the main circuit tab electrodes are symmetrical to an imaginary center line bisecting the stack direction as required by the claims. This imaginary line is interpreted to be a line that is perpendicular to a line drawn in the first direction that essentially cuts through both main circuit tab electrodes.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to put the main circuit tab electrodes on opposite side and perpendicular to the stack as well as perpendicular to the shared voltage measurement tabs as taught by Benson et al. in the battery of Meitav et al. in view of Fujita et al. and Okazaki et al. since it would enable the formation of a more compact configuration.

4. Claims 8-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Meitav et al. in view Fujita et al., Okazaki et al. and Benson et al. as applied to claim 7 above, and further in view of Sato et al. (US Patent 6,589,690).

The teachings of Meitav et al., Fujita et al., Okazaki et al. and Benson et al. as discussed above are incorporated herein.

Meitav et al. in view Fujita et al., Okazaki et al. and Benson et al. teach a battery having voltage measurement tabs but fail to teach the claimed materials for use in the battery cells.

Meitav et al. fail to teach specific material for use in a battery, but do teach that the user may select materials to satisfy their criteria (column 5 lines 60-62).

Sato et al. teach a lithium ion secondary battery (abstract; column 1 line 16). The battery has a nonaqueous electrolyte that permeates the electrodes. This is desirable since it produces a battery with a satisfactory life cycle (column 11 lines 40-42).

Sato et al. also teach that the anode may be made of metal oxide or a carbonaceous material, since both are capable of absorbing and desorbing lithium ions (column 10 lines 13-17).

It would be desirable to use the materials taught by Sato et al. in the battery of Meitav et al. in view Fujita et al., Okazaki et al. and Benson et al. since they are capable of absorbing and desorbing lithium ions; further, it would be desirable to use a nonaqueous electrolyte that permeates the electrodes since it would produce a battery with satisfactory life cycles, which is considered to be a possible criteria to be satisfied by the user taught in Meitav et al.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use the anode materials and nonaqueous electrolyte that permeates the electrodes as taught by Sato et al. in the battery of Meitav et al. in view of Fujita et al., Okazaki et al. and Benson et al. in order to produce a battery having anodes that are capable of absorbing and desorbing lithium ions and having satisfactory life cycles.

5. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Meitav et al. in view Fujita et al., Okazaki et al., Benson et al. and Sato et al. as applied to claim 11 above, and further in view of Loutfly et al. (US Patent 6,146,791).

The teachings of Meitav et al., Fujita et al., Okazaki et al., Benson et al. and Sato et al. as discussed above are incorporated herein.

Meitav et al. in view Fujita et al., Okazaki et al. and Sato et al. teach a lithium ion battery having voltage measurement tabs having carbon materials contained in the anode but fail to teach the use of hard carbon in the anode.

Loutfly et al. teach the use of hard carbon in the anode of lithium-ion batteries since the resulting anodes have low irreversible capacity loss.

It would have been desirable to use hard carbon in the anodes of the battery of Meitav et al. in view Fujita et al., Okazaki et al., Benson et al. and Sato et al. as taught by Loutfly et al. in order to prevent high irreversible capacity loss.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use hard carbon in the anodes of the battery of Meitav et al. in view Fujita et al., Okazaki et al., Benson et al. and Sato et al. as taught by Loutfly et al. in order to prevent high irreversible capacity loss.

6. Claims 17-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Meitav et al. in view of Fujita et al., Okazaki et al. and Benson et al. as applied to claim 13 above, and further in view of Evers et al. (US Patent 6,271,646).

The teachings of Meitav et al., Fujita et al., Okazaki et al. and Benson et al. as discussed above are incorporated herein.

Meitav et al. in view of Fujita et al., Okazaki et al. and Benson et al. teach the battery and controller of the claimed invention but fail to teach a current bypass circuit and electrical element that conducts depending on voltage.

Regarding claim 19, Fujita et al. teach that the power terminals contain resistors through which the power is transferred (column 3 lines 28-45, 54-61).

Evers et al. teach a battery charging and discharging network wherein the individual cell voltages are measured and used in operation of the battery. Evers et al. further teach circuitry for bypassing charging current to cells that have been measured at voltage levels equal to or higher than a specific voltage level (abstract).

As for claim 18, the element that provides voltage to an individual cell inherently would not conduct when the cell was greater than a certain voltage in order for the bypass circuit of Evers et al. to function.

The by-pass circuitry of Evers et al. prevents overcharging of cells and waste of energy by-passed from full cells, and equalizes the state of charge in the cells (column 2 lines 1-15).

It would be desirable to use the by-pass circuitry of Evers et al. with the discharge controller of Fujita et al. since the functions of the by-pass circuitry of Evers et al. would be desirable for discharging: in discharging, it would be desirable to prevent over discharging of cells, it would be desirable to prevent energy waste, and it would be desirable to equalize the state of charge in the cells.

Therefore, it would have been obvious to one having ordinary skill in the art at the time of the invention to use the by-pass circuitry of Evers et al. with the discharge controller of Meitav et al. in view of Fujita et al. in order to prevent over discharging of cells and energy waste, and to equalize the state of charge in the cells.

Response to Arguments

7. Applicant's arguments with respect to claims 1-20 have been considered but are moot in view of the new grounds of rejection as necessitated by applicant's amendment to the claims, see above.

8. Applicant's arguments filed June 11, 2008 concerning an alleged lack of teaching of two different types of electrodes, on page 10 of the Remarks, have been fully considered but they are not persuasive. The examiner has addressed both types of electrodes: the main circuit tab electrodes are taught in Meitav et al. and the voltage measurement tabs are taught in Okazaki et al. Applicant is directed to page 4, lines 4-9 of the Non-Final Rejection mailed March 27, 2008, where the examiner states that Meitav et al. in view of Fujita et al. fail to teach tabs for measuring the voltages, but Okazaki et al. teach tabular lead projections, or tabs, for measuring voltages.

Conclusion

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alix Elizabeth Echelmeyer whose telephone number is (571)272-1101. The examiner can normally be reached on Mon-Fri 8-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Susy N. Tsang-Foster can be reached on 571-272-1293. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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